

CLAIMS:

1. A vehicle-body-reinforcement disposition structure that is constructed by disposing a reinforcement in a vehicle body or a vehicular structural element formed by combining
5 two or more panels, wherein

the reinforcement is composed of a plate-shaped support element that extends at least partially along inner faces of the panels and that is disposed apart from the panels by a predetermined distance, and of a resin-molded element that exhibits hot-state foamability and that is disposed between the panels and a portion of the plate-shaped support element
10 which is disposed along the panels,

the resin-molded element in its pre-foaming state is supported on the plate-shaped support element and is located apart from the inner faces of the panels by a gap, and

the resin-molded element in its post-foaming state is in close contact with the panels while filling the gap between the plate-shaped support element and the panels.
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2. The vehicle-body-reinforcement disposition structure according to claim 1, wherein the inner faces of the panels, with which the resin-molded element is in close contact, is subjected to antirust liquid immersion treatment.

20 3. The vehicle-body-reinforcement disposition structure according to claim 1, wherein the resin-molded element and the plate-shaped support element are integrally formed by insert molding.

25 4. The vehicle-body-reinforcement disposition structure according to claim 1, wherein the resin-molded element and the plate-shaped support element are fixed to each other by engaging strips that engage them respectively.

5. The vehicle-body-reinforcement disposition structure according to claim 1, wherein the plate-shaped support element is disposed with its position relative to the panels being regulated by the engaging strips that engage the plate-shaped support element and the panels respectively.

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6. The vehicle-body-reinforcement disposition structure according to claim 5, wherein a fixed portion of the plate-shaped support element, with which a corresponding one of the engaging strips is in engagement, is disposed apart from the panels by a gap.

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7. The vehicle-body-reinforcement disposition structure according to claim 1, wherein the plate-shaped support element and/or the resin-molded element are/is fixed to the panels by welding, bonding, or fusing.

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8. The vehicle-body-reinforcement disposition structure according to claim 1, wherein the plate-shaped support element and/or the resin-molded element are/is disposed with their/its position(s) relative to the panels being regulated by a fastening structure portion formed on the panels.

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9. The vehicle-body-reinforcement disposition structure according to claim 1, wherein the plate-shaped support element and the resin-molded element are disposed with their positions relative to the panels being regulated by engaging strips that engage the plate-shaped support element, the resin-molded element, and the vehicle body panels respectively.

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10. The vehicle-body-reinforcement disposition structure according to claim 1, wherein

the resin-molded element forms at least one intermediate wall that extends between the inner faces of the panels in such a manner as to partition the interior of the vehicular structural element or the vehicle body.

11. The vehicle-body-reinforcement disposition structure according to claim 10, wherein

the at least one intermediate wall extends from a portion of the resin-molded element which is disposed along the panels to the inner faces of the panels that are opposed to that portion, the plate-shaped support element has a portion extending along both lateral faces of a portion of the resin-molded element which forms the intermediate wall, and a portion coupling those portions at an end of the intermediate wall extending toward the inner faces of the panels, and

the coupling portion is disposed apart from the inner faces of the panels by a gap.

12. The vehicle-body-reinforcement disposition structure according to claim 1, wherein

the resin-molded element has a property of foaming and expanding at a temperature of antirust liquid immersion treatment for a generally available vehicular panel.

13. The vehicle-body-reinforcement disposition structure according to claim 12, wherein

the resin-molded element has a property of foaming and expanding at a temperature of 150°C to 205°C.

14. The vehicle-body-reinforcement disposition structure according to claim 1, wherein

the resin-molded element exhibits a compressive strength equal to or higher than 10MPa and a shearing strength equal to or higher than 1MPa after having finished foaming.

15. The vehicle-body-reinforcement disposition structure according to claim 1, wherein

an adhesive force under shear between the resin-molded element and the panels is equal to or larger than 4MPa.

16. The vehicle-body-reinforcement disposition structure according to claim 1, wherein

the plate-shaped support element is constructed of a metal plate having a thickness smaller than 0.3mm and an elongation rate equal to or higher than 5% to 10%.

17. The vehicle-body-reinforcement disposition structure according to claim 1, wherein

the plate-shaped support element is made of heat-resistant resin and more greatly flexes than the resin-molded element without being destroyed.

18. The vehicle-body-reinforcement disposition structure according to claim 17, wherein

the resin constituting the plate-shaped support element is nylon 66.

19. The vehicle-body-reinforcement disposition structure according to claim 1, wherein

the plate-shaped support element is deformed in accordance with deformation of a columnar portion and the resin-molded element is held between the plate-shaped support element and the inner faces of the panels, for a sufficiently long period after formation of a crack in the resin-molded element in the course of deformation of the interior of the vehicular structural element or the vehicle body.

20. The vehicle-body-reinforcement disposition structure according to claim 19, wherein

the resin-molded element is held between the plate-shaped support element and the inner faces of the panels until the interior of the vehicular structural element or the vehicle body bends by a displacement stroke of 10mm or more, especially 20mm or more.

21. The vehicle-body-reinforcement disposition structure according to claim 1,
wherein

5 a bending load applied to the columnar portion is held equal to or larger than 10kN
for a sufficiently long period after formation of a crack in the resin-molded element in
the course of deformation of the interior of the vehicular structural element or the vehicle
body.

22. The vehicle-body-reinforcement disposition structure according to claim 21,
wherein

10 the bending load applied to the interior of the vehicular structural element or the
vehicle body is held equal to or larger than 10kN until the interior of the vehicular
structural element or the vehicle body bends by a displacement stroke of 10mm or more,
especially 20mm or more.